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AUTHOR Englebrook, Brian R.
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ABSTRACT

This study compared performance on the Word Recognition Inventory of eight students in grades 1-4 with attention deficit hyperactivity disorder either receiving medication or not receiving medication. The study found no significant differences between the two groups in word recognition. A review of the literature is attached. Appended are the inventory results for each student evaluated. (Contains 16 references.) (DB)

Medication Effects on Word Recognition of ADHD Students

By

Brian R. Englebrook

Presented in Partial Fulfillment of the Requirements for the

Degree of Master of Arts

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Abstract

The effects of the Word Recognition Inventory on medicated and non-medicated ADHD students were examined by testing eight communication impaired pupils from first to fourth grade levels. They were divided into two sample groups. The medicated group contained four males. The non-medicated group contained two females and two males. The basic premise of this study, therefore, was to detect a difference between medicated and non-medicated ADHD students on the pupil's skill in word recognition.

The conclusion of the study showed no significant difference between the medicated and non-medicated ADHD students. It is recommended a larger sampling of each group be required to approach a significant difference.

Acknowledgements

I wish to thank Sharon Capano, the Demonstration Teacher, who assisted me with various data and a more thorough depth into the Communication Impaired classification along with the effects of Attention Deficit Hyperactivity Disorder among the students I tested.

Finally, I wish to thank Dr. Albert Mazurkiewicz, advisor, mentor and Chairperson of the Communication Science and Educational Services Department of Kean University for exceeding his duties in this project with never ending support.

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Lipson and Wixson (1997) report learning to read is based on complex cognitive, emotional, social, and instructional factors. At the heart of being able to construct meaning is the ability to recognize words automatically. When children are able to decode words easily, attention can be devoted to comprehension and personal response; thus, reading is rewarding, fun, and becomes an activity of choice.

For those children who struggle with decoding, the task of reading can be very frustrating. Because reading is difficult, children's attitudes about it are often poor, and they avoid reading activities. When children don't read books, they fail to develop fluency and miss out on the opportunity to gain additional knowledge and vocabulary, which could help them in future reading experiences. As classroom demands increase and understanding texts becomes more dependent on students' background knowledge and vocabulary, children who have limited contact with books find decoding and comprehension of text increasingly difficult. Stanovich (1986) has explained these differences between skilled and unskilled readers as, "the rich get richer, and the poor get poorer", in, "the Matthews Effects." Embedded in this poignant anecdote could be the student's perception as a poor reader, which may come from the fact that he or she has not unlocked the mysteries of decoding.

Given the pervasiveness and persistence of hyperactive behavior disorders, major amounts of public, professional, and scientific attention have been devoted to their treatment. For some years, the call has been out for definitive comparisons pitting pharmacological against psychosocial therapies in order to identify the single superior approach or the optimal

combination of treatment ingredients for the hyperactive child. Whelan and Henker (1991) argue that most such questions are untenable and untestable and in fact divert energy from the fundamental issues of concern both to the clinical investigator and the practitioner. For example, studies show school referrals exhibit more difficulties in concentration, whereas clinic caseloads contain a higher percentage of disruptive behavior. According to Whelan and Henker (1991) these samplings differences impair the validity of efficacy tests across clinics and studies and may be prime contributors to the contradictions in the published literature.

Cognitive-behavioral treatments lack clarity due to problems of calibration in a comparative efficacy study. What types and amounts of behavioral or cognitive treatment are comparable to a 20mg, twice-daily dose of methylphenidate? What is a minimally effective or standard dose of cognitive-behavioral training? What duration of behavioral intervention is comparable to 6 months of stimulant treatment? How can therapist contact be equated or its effects controlled across treatments when cognitive-behavior requires far more frequent and intense sessions than does stimulant treatment, and when the target of change in behavior treatment may be the parent or teacher rather than the ADHD child? In many cases, it is impossible to know whether poor outcomes should be attributed to ineffective treatments or to failure to follow or complete a therapeutic regimen (Whelan and Henker, 1991).

Stimulant treatment suffers the least from procedural variations, given the simplicity and regularity of the procedures and, in research settings, the ready availability of placebos. In a

drug study, when appropriate blinds are in place, the effects pose few attributional dilemmas; a medication ingested is a treatment delivered. Up to 70-80% of children with carefully diagnosed ADHD appear to exhibit a positive response to CNS stimulants (Barkley, 1998).

Hypothesis

However, no comprehensive review of research concerning participation on a medication regime of ADHD students and its effects toward word recognition have been published during the past decade. It was hypothesized that no significant difference in word recognition would be shown whether or not a sample of students are on a medication regime.

Procedures

In order to discover information concerning medication effects on reading levels of ADHD students, the Word Recognition Inventory (1964) test was administered.

Eight students were selected to participate in this study. Initially, these students were classified ADHD/ADD and a part of the communication impaired resource room program on the basis of previous diagnostic testing by the child study teams of different Public School Districts within Union County located in New Jersey. Students were randomly selected within the

primary program from first to fourth grade levels. The group contained six males and two females. Among the group four students were on a medication regimen and four without.

The testing took place during the week of March 20, 2000. The students were all tested by this researcher. They were given both the Word Recognition Inventory test within the resource room reading class.

The Word Recognition Inventory test was administered to provide a quick check on the pupil's skill in word recognition and thus gain an approximation of his or her independent and instructional reading levels. To establish whether there was a detectable difference between medicated and non-medicated ADHD students' achievement, the total scores were examined. An analysis of the data was then made to determine if there was a significant difference between the groups in terms of age and then in terms of their instructional levels using the t Test.

Results

The results of this study, as indicated in Tables 1 and 2, supports this researcher's hypothesis that no significant difference in word recognition would be shown whether or not ADHD students are on a medication regime or not.

Table I

Students' Age

Sample	Mean	Standard Deviation	t
Medicated:	8.25	1.71	.62
Non-Medicated:	7.50	1.73	

NS

Table II

Students' Instructional Level

Sample	Mean	Standard Deviation	t
Medicated:	1.60	1.15	.45
Non-Medicated	2.15	2.14	

NS

Table 2 indicates a mean difference of 55 in favor of the non-medicated pupils, however, the t-test results were non-significant.

Conclusions

The hypothesis of this study was to examine whether or not a sample of ADHD students with or without a medication regime would not exhibit a difference in achievement after being administered the Word Recognition Inventory test. The hypothesis was accepted in that there were no significant differences between the two groups sampled.

According to the instructional level results, two non-medicated students scored in the 4th grade level, (85%, 100%). These were the highest grade levels among all scores within the two groups. The male student was matched closest to his reading level and his decoding skills were well defined. The non-medicated female who scored a 100% was the only classified Autistic among both groups, however, her reading comprehension, according to the demonstration teacher, was particularly low for her age.

Although a pupil might receive scores which would suggest that he or she has several independent or instructional levels, the highest level achieved in each score is accepted as the point of placement. One who has acquired the strategies for decoding and making sense of text is on their way to becoming a skilled reader.

The implications of this study suggest further studies should be conducted with a larger sample of medicated and non-medicated subjects to determine whether the Word Recognition Inventory test would show a significant difference between the two groups.

Reading Achievement and Medication Effects on ADHD Students:

Related Literature

It is estimated that 50 to 65% of individuals who were diagnosed with ADHD as children continue to exhibit difficulties into their adult years (Barkley, 1998). *Hyperactivity* may be observed in such behaviors as fidgetiness or squirming in one's seat, excessive running or climbing in inappropriate situations, appearing *on the go* or as if *driven by a motor*, or by talking excessively (APA, 1994).

The prevalence of ADHD is estimated at 3 to 5% of school-age children in the US and the disorder occurs much more frequently in males than females, with ratios ranging from 4:1 to 9:1, depending on the setting (APA, 1994). Although ADHD is considered a childhood disorder and is usually diagnosed in the early school years, a large number of children (up to 70%) continue to manifest symptoms in adolescence (Gittelman, Mannuzza, Shenker, & Bonagura, 1985; as cited in Richters et al., 1995). During their teenage years, these individuals may exhibit poor academic performance and behavior problems at home and school, such as, temper tantrums, defiance, police contacts, and rejection by peers (Barkley, 1998).

The usefulness of psycho-stimulants in reducing hyperactivity was first reported more than fifty years ago, when children taking the psycho-stimulant benzedrine showed longer attention spans and improved ability to concentrate, with a corresponding decrease in hyperactivity and oppositional behavior (Lerner, 1997).

Current research on ADHD suggests that the psycho-stimulant medication affects the brain in these individuals by increasing the arousal or alertness of the central nervous system. It is thought that these individuals do not produce sufficient neurotransmitters, chemicals within the brain that transmit messages from one cell to another across a gap or synapse. The psycho-stimulants work by stimulating the production of the chemical neurotransmitters needed to send information from the brain stem to the parts of the brain that deal with attention (Barkley, 1998).

A variety of medications have been used to treat ADHD. The most widely prescribed treatment is psycho-stimulant medication, particularly methylphenidate (Whalen & Henker, 1991). Stimulants have been shown to increase levels of compliance and sustained attention, and to have positive effects on parent-child interactions, problem-solving, activities with peers, and a variety of controlled laboratory and academic tasks (Richters et al., 1995). In addition, Dr Silver (1992) reported results of psycho-stimulant medications appear to lengthen the children's attention spans, control impulsivity, decrease distractibility and motor activity, and improve visual-motor integration.

A landmark study by Gittelman-Klein (1976) reported to compare the relative efficacy of stimulant medication (methylphenidate) and behavior modification alone and in combination. Their study consisted of 75 subjects who were elementary school children between the ages of 6 and 12, referred for hyperactivity and attentional problems in the classroom. The results of the Global Improvement Ratings revealed that teachers rated 100% of the children who received

medication plus behavior therapy as improved, 75% of the medication alone children as improved, and 56% of the behavior therapy plus placebo children as improved. The psychiatrists rated 100% of the children who received medication plus behavior therapy as improved, 83% of the medication alone children as improved, and 44% of the behavior therapy plus placebo children as improved.

Gittelman-Klein and her associates (1976) argued that their study provides strong evidence for the use of methylphenidate in treating ADHD children, whether the medication is used alone or in combination with behavior therapy. Although each of the three treatments produced significant clinical improvement, children treated with a combination of methylphenidate and behavior therapy showed the most gains, followed by those treated with medication alone.

Firestone et al. (1981) conducted a study similar to Gittelman-Klein and associates (1976), comparing the differential effects of parent training and stimulant medication on hyperactive children. Unlike Gittelman-Klein et al.'s study however, Firestone and his colleagues were interested in determining the effects of these interventions on academic achievement as well as behavior.

Two measures of academic achievement were obtained The Gates-MacGintie Reading Tests and the Arithmetic Subject Test of the Metropolitan Achievement Tests. The authors reported only 43 families followed the treatment prescriptions and completed the posttests. There were twelve children in the medication only group. Thirteen in the parent training plus placebo group, and eighteen in the parent training plus medication group.

An analysis of treatment effects showed that all three groups improved academic achievement on the Metropolitan Achievement Test, whereas only the medication groups improved on the Gates-MacGintie Verbal scores. On the reaction-time test, the medication groups showed significant improvement on reaction time and impulse control.

Indeed, the present study represents a rather strict test of drug effects, for example, careful specification of ADHD, division by subgroups of ADHD, more realistic measures of academic performance, control for floor and ceiling effects by yoking to entering reading scores, use of different dosage levels, and careful measurement of responder status (Forness, et el., 1992). Those effects that approached significance are worth noting.

The study examined sustained effects of methylphenidate on reading performance in a sample of 42 boys, ages 8 to 11, with ADHD. Two subgroups were based on the presence or absence of co-occurring conduct disorders. Subjects were selected on the basis of their positive response to methylphenidate as determined in a series of original medication trials (Forness,

Cantwell, Swanson, Hanna, & Youpa, 1991). For the purpose of their study, subjects were placed on their optimal dose of medication for a 6-week period and then tested on measures of oral reading and reading comprehension equivalent to those used in the original trials. They were then re-tested after a week without medication (placebo), then tested again the following week after return to medication. Only the subgroup with conduct disorders responded, and the response was limited to reading comprehension improvement in only those subjects who also demonstrated improvement in oral reading on original trials.

Forness et al. (1992) reported these mixed ADHD subjects were the only ones with even a tendency toward improved performance on sustained treatment with methylphenidate in the present study. Oral reading or decoding involves primarily associative memory, while reading comprehension requires this same associative memory to operate at a much more automatic and fluent level. It also requires the ability to invoke much more complex associative and serial processes in combination with retrieval of prior linguistic and experiential knowledge. As noted, Taylor (1988) suggested that pure ADHD may be less cognitively debilitating, overall, compared to the mixture of both ADHD and conduct disorders. The combination of attentional difficulties and the adverse environmental consequences of conduct disorders may act cohesively to diminish concentration on a more complex task, such as reading comprehension.

According to Forness et al. (1992) this hypothesis is only speculative and rests on relatively limited evidence of additional neuro-psychological and related cognitive disabilities in

children or adolescents with conduct or oppositional disorders. The conduct or oppositional defiant disorders as a syndrome may bring added cognitive liabilities to the syndrome of ADHD, however, in this study it supports speculation about why only this group tended toward improvement on this task. It has been suggested that subjects' effort improves on complex tasks when they are administered stimulant medication and improved effort may have indeed tended to benefit the mixed ADHD subgroup on the more complex task of reading comprehension.

Published reviews of the research investigating multimodal treatments for ADHD have focused on two specific treatment combinations. Pelham and Murphy (1986) examined studies which combined stimulant medication with behavioral interventions, whereas Abikoff (1985), in his review of cognitive interventions for ADHD, reported on studies which combined stimulant medication and cognitive therapy.

For better or for worse, the predominant therapy continues to be stimulant treatment, primarily methylphenidate. The vast majority of children diagnosed ADHD receive a course of medication that usually continues at least for several months and often throughout the school-age years. In one recent survey of primary care physicians, Whalen and Henker (1991) found that 88% of children considered hyperactive had received methylphenidate.

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Appendices

Appendix A:

Inventory Results of Medicated Students

T. O.

Word Recognition Inventory

Albert J. Mazurkiewicz

Pupil MEDICATED Age 9

Grade 1 Date 032400

Pre-Primer 95
Primer 95
1st 75
2-1 30
2-2 45
3-1 ____
3-2 ____
4th ____

Directions: Ask the child to read down the list of words. Check (✓) all correct responses; mark with a zero (0) a lack of response; record all incorrect responses. Allow the pupil five seconds to try each word. Then ask him to continue reading down the list.

Pre-Primer Level

	Stimulus	*Response*
1.	and	✓
2.	ball	✓
3.	come	✓
4.	father	0
5.	get	✓
6.	here	✓
7.	I	✓
8.	in	✓
9.	is	✓
10.	look	✓
11.	little	✓
12.	mother	✓
13.	not	✓
14.	play	✓
15.	said	✓
16.	see	✓
17.	the	✓
18.	want	✓
19.	will	✓
20.	you	✓

Number correct 19 x5=
Percentage correct 95

Primer Level

Stimulus	*Response*
are	✓
at	✓
away	✓
boat	✓
can	✓
did	✓
find	✓
for	✓
girl	✓
kitten	✓
me	✓
my	✓
now	✓
one	✓
saw	0
some	✓
thank	✓
they	✓
we	✓
with	✓

Number correct 19 x5=
Percentage correct 95

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First Reader Level

Stimulus	Response
1. again	0
2. as	✓
3. by	✓
4. fast	✓
5. guess	✓
6. how	0
7. know	✓
8. many	✓
9. never	✓
10. next	✓
11. off	✓
12. over	0
13. party	✓
14. some	✓
15. tell	0
16. thing	✓
17. took	✓
18. walk	✓
19. way	✓
20. would	0

Number correct 15 x5=

Percentage correct 75

Second – 1 Reader Level

Stimulus	Response
across	0
almost	✓
been	✓
bark	✓
boats	0
both	✓
care	0
clever	0
dress	✓
fire	0
hour	0
hard	✓
miss	✓
off	✓
place	0
roof	0
shall	0
through	0
together	✓
wash	✓

Number correct 10 x5=

Percentage correct 50

Second – 2 Reader Level

	Stimulus	Response
1.	above	✓
2.	anything	✓
3.	blanket	0
4.	broke	0
5.	cook	0
6.	decided	0
7.	flew	✓
8.	gone	✓
9.	grass	0
10.	great	0
11.	leave	✓
12.	much	✓
13.	north	0
14.	poor	0
15.	pumpkin	0
16.	side	✓
17.	should	✓
18.	string	0
19.	third	0
20.	while	✓

Number correct 9 x5=

Percentage correct 45

Third – 1 Reader Level

Stimulus	Response
able	
added	
beauty	
cents	
clothe	
daddy	
different	
edge	
fasten	
fox	
half	
hot	
hundred	
lot	
lonely	
mind	
north	
queen	
secret	
whole	

Number correct _____ x5=

Percentage correct_____

T. O.

Word Recognition Inventory

Albert J. Mazurkiewicz

Pre-Primer 70
Primer 75
1st 55
2-1 30
2-2 ____
3-1 ____
3-2 ____
4th ____

Pupil MEDICATED Age 6

Grade 1 (BEGINNER) Date 032400

Directions: Ask the child to read down the list of words. Check (✓) all correct responses; mark with a zero (0) a lack of response; record all incorrect responses. Allow the pupil five seconds to try each word. Then ask him to continue reading down the list.

Pre-Primer Level

	Stimulus	Response
1.	and	✓
2.	ball	✓
3.	come	✓
4.	father	0
5.	get	✓
6.	here	0
7.	I	0
8.	in	✓
9.	is	✓
10.	look	✓
11.	little	✓
12.	mother	0
13.	not	✓
14.	play	0
15.	said	0
16.	see	✓
17.	the	✓
18.	want	✓
19.	will	✓
20.	you	✓

Number correct 14 x5=
Percentage correct 70

Primer Level

Stimulus	Response
are	✓
at	✓
away	0
boat	✓
can	✓
did	✓
find	0
for	✓
girl	✓
kitten	✓
me	✓
my	✓
now	✓
one	✓
saw	0
some	✓
thank	0
they	0
we	✓
with	✓

Number correct 15 x5=
Percentage correct 75

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First Reader Level

Stimulus	*Response*
1. again	0
2. as	✓
3. by	0
4. fast	✓
5. guess	0
6. how	✓
7. know	0
8. many	0
9. never	0
10. next	✓
11. off	✓
12. over	0
13. party	0
14. some	✓
15. tell	0
16. thing	✓
17. took	✓
18. walk	✓
19. way	✓
20. would	✓

Number correct 11 x5=
Percentage correct 55

Second – 1 Reader Level

Stimulus	*Response*
across	0
almost	0
been	✓
bark	✓
boats	0
both	0
care	0
clever	0
dress	0
fire	0
hour	0
hard	✓
miss	0
off	✓
place	0
roof	0
shall	✓
through	0
together	0
wash	✓

Number correct 6 x5=
Percentage correct 30

T. O.

Word Recognition Inventory

Albert J. Mazurkiewicz

Pupil MEDICATED Age 8

Grade 1 (ENDING) Date 032400

Pre-Primer 100
Primer 100
1st 100
2-1 70
2-2 60
3-1 75
3-2 ____
4th ____

Directions: Ask the child to read down the list of words. Check (✓) all correct responses; mark with a zero (0) a lack of response; record all incorrect responses. Allow the pupil five seconds to try each word. Then ask him to continue reading down the list.

Pre-Primer Level

	Stimulus	Response
1.	and	✓
2.	ball	✓
3.	come	✓
4.	father	✓
5.	get	✓
6.	here	✓
7.	I	✓
8.	in	✓
9.	is	✓
10.	look	✓
11.	little	✓
12.	mother	✓
13.	not	✓
14.	play	✓
15.	said	✓
16.	see	✓
17.	the	✓
18.	want	✓
19.	will	✓
20.	you	✓

Number correct 20 x5=
Percentage correct 100

Primer Level

	Stimulus	Response
	are	✓
	at	✓
	away	✓
	boat	✓
	can	✓
	did	✓
	find	✓
	for	✓
	girl	✓
	kitten	✓
	me	✓
	my	✓
	now	✓
	one	✓
	saw	✓
	some	✓
	thank	✓
	they	✓
	we	✓
	with	✓

Number correct 20 x5=
Percentage correct 100

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First Reader Level

Stimulus	*Response*
1. again	✓
2. as	✓
3. by	✓
4. fast	✓
5. guess	✓
6. how	✓
7. know	✓
8. many	✓
9. never	✓
10. next	✓
11. off	✓
12. over	✓
13. party	✓
14. some	✓
15. tell	✓
16. thing	✓
17. took	✓
18. walk	✓
19. way	✓
20. would	✓

Number correct 20 x5=
Percentage correct 100

Second – 1 Reader Level

Stimulus	*Response*
across	0
almost	✓
been	✓
bark	0
boats	✓
both	✓
care	0
clever	0
dress	✓
fire	✓
hour	✓
hard	✓
miss	✓
off	✓
place	✓
roof	✓
shall	0
through	0
together	✓
wash	✓

Number correct 14 x5=
Percentage correct 70

Second – 2 Reader Level

	Stimulus	Response
1.	above	0
2.	anything	✓
3.	blanket	0
4.	broke	✓
5.	cook	✓
6.	decided	0
7.	flew	0
8.	gone	✓
9.	grass	✓
10.	great	✓
11.	leave	✓
12.	much	0
13.	north	✓
14.	poor	✓
15.	pumpkin	✓
16.	side	0
17.	should	0
18.	string	✓
19.	third	✓
20.	while	0

Number correct 12 x5=
Percentage correct 60

Third – 1 Reader Level

Stimulus	Response
able	✓
added	✓
beauty	0
cents	✓
clothe	✓
daddy	✓
different	✓
edge	0
fasten	0
fox	✓
half	✓
hot	✓
hundred	0
lot	✓
lonely	0
mind	✓
north	✓
queen	✓
secret	✓
whole	✓

Number correct 15 x5=
Percentage correct 75

T. O.

Word Recognition Inventory

Albert J. Mazurkiewicz

Pupil MEDICATED Age 10

Grade 2 (BEGINNER) Date 032400

Pre-Primer 100
Primer 100
1st 100
2-1 95
2-2 85
3-1 90
3-2 75
4th 50

Directions: Ask the child to read down the list of words. Check (✓) all correct responses; mark with a zero (0) a lack of response; record all incorrect responses. Allow the pupil five seconds to try each word. Then ask him to continue reading down the list.

Pre-Primer Level

	Stimulus	Response
1.	and	✓
2.	ball	✓
3.	come	✓
4.	father	✓
5.	get	✓
6.	here	✓
7.	I	✓
8.	in	✓
9.	is	✓
10.	look	✓
11.	little	✓
12.	mother	✓
13.	not	✓
14.	play	✓
15.	said	✓
16.	see	✓
17.	the	✓
18.	want	✓
19.	will	✓
20.	you	✓

Number correct 20 x5=

Percentage correct 100

Primer Level

	Stimulus	Response
	are	✓
	at	✓
	away	✓
	boat	✓
	can	✓
	did	✓
	find	✓
	for	✓
	girl	✓
	kitten	✓
	me	✓
	my	✓
	now	✓
	one	✓
	saw	✓
	some	✓
	thank	✓
	they	✓
	we	✓
	with	✓

Number correct 20 x5=

Percentage correct 100

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First Reader Level

Stimulus	*Response*
1. again	✓
2. as	✓
3. by	✓
4. fast	✓
5. guess	✓
6. how	✓
7. know	✓
8. many	✓
9. never	✓
10. next	✓
11. off	✓
12. over	✓
13. party	✓
14. some	✓
15. tell	✓
16. thing	✓
17. took	✓
18. walk	✓
19. way	✓
20. would	✓

Number correct 20 x5=

Percentage correct 100

Second – 1 Reader Level

Stimulus	*Response*
across	✓
almost	✓
been	✓
bark	✓
boats	✓
both	✓
care	✓
clever	✓
dress	✓
fire	✓
hour	✓
hard	✓
miss	✓
off	✓
place	✓
roof	✓
shall	0
through	✓
together	✓
wash	✓

Number correct 19 x5=

Percentage correct 95

Second – 2 Reader Level

	Stimulus	*Response*
1.	above	✓
2.	anything	✓
3.	blanket	0
4.	broke	✓
5.	cook	✓
6.	decided	0
7.	flew	0
8.	gone	✓
9.	grass	✓
10.	great	✓
11.	leave	✓
12.	much	✓
13.	north	✓
14.	poor	✓
15.	pumpkin	✓
16.	side	✓
17.	should	✓
18.	string	✓
19.	third	✓
20.	while	✓

Number correct 17 x5=
Percentage correct 85

Third – 1 Reader Level

Stimulus	*Response*
able	✓
added	✓
beauty	0
cents	✓
clothe	✓
daddy	✓
different	✓
edge	✓
fasten	✓
fox	✓
half	✓
hot	✓
hundred	✓
lot	✓
lonely	0
mind	✓
north	✓
queen	✓
secret	✓
whole	✓

Number correct 18 x5=
Percentage correct 90

Third – 2 Reader Level

Stimulus	Response
1. act	✓
2. beautiful	✓
3. bounce	0
4. careful	✓
5. chance	0
6. empty	0
7. except	0
8. handkerchief	✓
9. hoof	✓
10. invite	✓
11. journey	✓
12. kept	✓
13. path	✓
14. possible	0
15. really	✓
16. scared	✓
17. spell	✓
18. sugar	✓
19. twenty	✓
20. wonderful	✓

Number correct 15 x5=

Percentage correct 75

Fourth Reader Level

Stimulus	Response
abandon	0
audience	0
beneath	0
chimney	✓
committee	✓
crew	✓
destroy	✓
encounter	0
gleaming	0
harvest	✓
junior	0
model	✓
mystery	✓
neither	0
protect	✓
royal	✓
raise	0
scientist	0
strength	0
underneath	✓

Number correct 10 x5=

Percentage correct 50

Appendix B:

Inventory Results of Non-Medicated Students

T. O.

Word Recognition Inventory

Albert J. Mazurkiewicz

Pupil NON-Medicated Age 6

Grade 1 Date 032400

Pre-Primer 100
Primer 100
1st 100
2-1 100
2-2 95
3-1 95
3-2 95
4th 85

Directions: Ask the child to read down the list of words. Check (✓) all correct responses; mark with a zero (0) a lack of response; record all incorrect responses. Allow the pupil five seconds to try each word. Then ask him to continue reading down the list.

Pre-Primer Level

	Stimulus	Response
1.	and	✓
2.	ball	✓
3.	come	✓
4.	father	✓
5.	get	✓
6.	here	✓
7.	I	✓
8.	in	✓
9.	is	✓
10.	look	✓
11.	little	✓
12.	mother	✓
13.	not	✓
14.	play	✓
15.	said	✓
16.	see	✓
17.	the	✓
18.	want	✓
19.	will	✓
20.	you	✓

Number correct 20 x5=

Percentage correct 100

Primer Level

	Stimulus	Response
	are	✓
	at	✓
	away	✓
	boat	✓
	can	✓
	did	✓
	find	✓
	for	✓
	girl	✓
	kitten	✓
	me	✓
	my	✓
	now	✓
	one	✓
	saw	✓
	some	✓
	thank	✓
	they	✓
	we	✓
	with	✓

Number correct 20 x5=

Percentage correct 100

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First Reader Level

	Stimulus	*Response*
1.	again	✓
2.	as	✓
3.	by	✓
4.	fast	✓
5.	guess	✓
6.	how	✓
7.	know	✓
8.	many	✓
9.	never	✓
10.	next	✓
11.	off	✓
12.	over	✓
13.	party	✓
14.	some	✓
15.	tell	✓
16.	thing	✓
17.	took	✓
18.	walk	✓
19.	way	✓
20.	would	✓

Number correct 20 x5=

Percentage correct 100

Second – 1 Reader Level

Stimulus	*Response*
across	✓
almost	✓
been	✓
bark	✓
boats	✓
both	✓
care	✓
clever	✓
dress	✓
fire	✓
hour	✓
hard	✓
miss	✓
off	✓
place	✓
roof	✓
shall	✓
through	✓
together	✓
wash	✓

Number correct 20 x5=

Percentage correct 100

Second – 2 Reader Level

	Stimulus	Response
1.	above	✓
2.	anything	✓
3.	blanket	✓
4.	broke	✓
5.	cook	✓
6.	decided	0
7.	flew	✓
8.	gone	✓
9.	grass	✓
10.	great	✓
11.	leave	✓
12.	much	✓
13.	north	✓
14.	poor	✓
15.	pumpkin	✓
16.	side	✓
17.	should	✓
18.	string	✓
19.	third	✓
20.	while	✓

Number correct 19 x5=
Percentage correct 95

Third – 1 Reader Level

Stimulus	Response
able	✓
added	✓
beauty	✓
cents	✓
clothe	0
daddy	✓
different	✓
edge	✓
fasten	✓
fox	✓
half	✓
hot	✓
hundred	✓
lot	✓
lonely	✓
mind	✓
north	✓
queen	✓
secret	✓
whole	✓

Number correct 19 x5=
Percentage correct 95

Third – 2 Reader Level

Stimulus	Response
1. act	✓
2. beautiful	✓
3. bounce	✓
4. careful	✓
5. chance	✓
6. empty	✓
7. except	0
8. handkerchief	✓
9. hoof	✓
10. invite	✓
11. journey	✓
12. kept	✓
13. path	✓
14. possible	✓
15. really	✓
16. scared	✓
17. spell	✓
18. sugar	✓
19. twenty	✓
20. wonderful	✓

Number correct 19 x5=

Percentage correct 95

Fourth Reader Level

Stimulus	Response
abandon	✓
audience	0
beneath	✓
chimney	✓
committee	✓
crew	✓
destroy	✓
encounter	✓
gleaming	✓
harvest	✓
junior	✓
model	✓
mystery	✓
neither	✓
protect	0
royal	0
raise	✓
scientist	✓
strength	✓
underneath	✓

Number correct 17 x5=

Percentage correct 85

T. O.

Word Recognition Inventory

Albert J. Mazurkiewicz

Pre-Primer 85
Primer 70
1st 80
2-1 40
2-2 60
3-1 ____
3-2 ____
4th ____

Pupil NON-MEDICATED Age 9

Grade 1 Date 032400

Directions: Ask the child to read down the list of words. Check (✓) all correct responses; mark with a zero (0) a lack of response; record all incorrect responses. Allow the pupil five seconds to try each word. Then ask him to continue reading down the list.

Pre-Primer Level

	Stimulus	Response
1.	and	✓
2.	ball	✓
3.	come	✓
4.	father	0 ✓
5.	get	✓
6.	here	0
7.	I	✓
8.	in	✓
9.	is	✓
10.	look	✓
11.	little	✓
12.	mother	✓
13.	not	✓
14.	play	✓
15.	said	✓
16.	see	✓
17.	the	✓
18.	want	0
19.	will	✓ ✓
20.	you	✓

Number correct 17 x5=

Percentage correct 85

Primer Level

Stimulus	Response
are	✓
at	✓
away	0
boat	0
can	0
did	✓
find	0
for	✓
girl	✓
kitten	✓
me	✓
my	✓
now	0
one	✓
saw	✓
some	✓
thank	0
they	✓
we	✓
with	✓

Number correct 14 x5=

Percentage correct 70

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First Reader Level

Stimulus	*Response*
1. again	0
2. as	✓
3. by	✓
4. fast	0
5. guess	0
6. how	✓
7. know	✓
8. many	✓
9. never	✓
10. next	✓
11. off	✓
12. over	✓
13. party	0
14. some	✓
15. tell	✓
16. thing	✓
17. took	✓
18. walk	✓
19. way	✓
20. would	✓

Number correct 16 x5=
Percentage correct 80

Second – 1 Reader Level

Stimulus	*Response*
across	0
almost	0
been	✓
bark	0
boats	0
both	✓
care	0
clever	0
dress	0
fire	0
hour	0
hard	✓
miss	✓
off	✓
place	✓
roof	0
shall	0
through	✓
together	✓
wash	0

Number correct 8 x5=
Percentage correct 40

Second – 2 Reader Level

Stimulus	*Response*
1. above	0
2. anything	0
3. blanket	0
4. broke	✓
5. cook	✓
6. decided	0
7. flew	0
8. gone	✓
9. grass	✓
10. great	0
11. leave	✓
12. much	✓
13. north	✓
14. poor	✓
15. pumpkin	0
16. side	✓
17. should	✓
18. string	✓
19. third	✓
20. while	0

Number correct 12 x5=
Percentage correct 60

Third – 1 Reader Level

Stimulus	*Response*
able	
added	
beauty	
cents	
clothe	
daddy	
different	
edge	
fasten	
fox	
half	
hot	
hundred	
lot	
lonely	
mind	
north	
queen	
secret	
whole	

Number correct _____ x5=
Percentage correct_____

T. O.

Word Recognition Inventory

Albert J. Mazurkiewicz

Pre-Primer 85
Primer 85
1st 60
2-1 40
2-2 ____
3-1 ____
3-2 ____
4th ____

Pupil NON-MEDICATED Age 6

Grade 1 (Beginner) Date 032400

Directions: Ask the child to read down the list of words. Check (✓) all correct responses; mark with a zero (0) a lack of response; record all incorrect responses. Allow the pupil five seconds to try each word. Then ask him to continue reading down the list.

Pre-Primer Level

	Stimulus	*Response*
1.	and	✓
2.	ball	✓
3.	come	✓
4.	father	0
5.	get	✓
6.	here	✓
7.	I	0
8.	in	✓
9.	is	✓
10.	look	✓
11.	little	✓
12.	mother	0
13.	not	✓
14.	play	✓
15.	said	✓
16.	see	✓
17.	the	✓
18.	want	✓
19.	will	✓
20.	you	✓

Number correct 17 x5=
Percentage correct 85

Primer Level

	Stimulus	*Response*
	are	0
	at	✓
	away	✓
	boat	✓
	can	✓
	did	✓
	find	0
	for	✓
	girl	✓
	kitten	✓
	me	✓
	my	✓
	now	✓
	one	✓
	saw	✓
	some	✓
	thank	0
	they	✓
	we	✓
	with	✓

Number correct 17 x5=
Percentage correct 85

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First Reader Level

Stimulus	Response
1. again	0
2. as	✓
3. by	✓
4. fast	✓
5. guess	0
6. how	0
7. know	0
8. many	0
9. never	✓
10. next	✓
11. off	✓
12. over	✓
13. party	0
14. some	✓
15. tell	✓
16. thing	0
17. took	✓
18. walk	✓
19. way	✓
20. would	0

Number correct 12 x5=
Percentage correct 60

Second – 1 Reader Level

Stimulus	Response
across	0
almost	0
been	✓
bark	0
boats	✓
both	0
care	0
clever	0
dress	✓
fire	0
hour	0
hard	0
miss	✓
off	✓
place	✓
roof	0
shall	✓
through	0
together	0
wash	✓

Number correct 8 x5=
Percentage correct 40

T. O.

Word Recognition Inventory

Albert J. Mazurkiewicz

Pupil NON-MEDICATED Age 9

Grade 2 Date 032400

Pre-Primer 100
Primer 100
1st 100
2-1 100
2-2 100
3-1 100
3-2 100
4th 100

Directions: Ask the child to read down the list of words. Check (✓) all correct responses; mark with a zero (0) a lack of response; record all incorrect responses. Allow the pupil five seconds to try each word. Then ask him to continue reading down the list.

Pre-Primer Level

	Stimulus	*Response*
1.	and	✓
2.	ball	✓
3.	come	✓
4.	father	✓
5.	get	✓
6.	here	✓
7.	I	✓
8.	in	✓
9.	is	✓
10.	look	✓
11.	little	✓
12.	mother	✓
13.	not	✓
14.	play	✓
15.	said	✓
16.	see	✓
17.	the	✓
18.	want	✓
19.	will	✓
20.	you	✓

Number correct 20 x5= 48
Percentage correct 100

Primer Level

	Stimulus	*Response*
	are	✓
	at	✓
	away	✓
	boat	✓
	can	✓
	did	✓
	find	✓
	for	✓
	girl	✓
	kitten	✓
	me	✓
	my	✓
	now	✓
	one	✓
	saw	✓
	some	✓
	thank	✓
	they	✓
	we	✓
	with	✓

Number correct 20 x5=
Percentage correct 100

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First Reader Level

Stimulus	Response
1. again	✓
2. as	✓
3. by	✓
4. fast	✓
5. guess	✓
6. how	✓
7. know	✓
8. many	✓
9. never	✓
10. next	✓
11. off	✓
12. over	✓
13. party	✓
14. some	✓
15. tell	✓
16. thing	✓
17. took	✓
18. walk	✓
19. way	✓
20. would	✓

Number correct 20 x5=
Percentage correct 100

Second – 1 Reader Level

Stimulus	Response
across	✓
almost	✓
been	✓
bark	✓
boats	✓
both	✓
care	✓
clever	
dress	✓
fire	✓
hour	✓
hard	✓
miss	✓
off	✓
place	✓
roof	✓
shall	✓
through	✓
together	✓
wash	✓

Number correct 20 x5=
Percentage correct 100

Second – 2 Reader Level

	Stimulus	*Response*
1.	above	✓
2.	anything	✓
3.	blanket	✓
4.	broke	✓
5.	cook	✓
6.	decided	✓
7.	flew	✓
8.	gone	✓
9.	grass	✓
10.	great	✓
11.	leave	✓
12.	much	✓
13.	north	✓
14.	poor	✓
15.	pumpkin	✓
16.	side	✓
17.	should	✓
18.	string	✓
19.	third	✓
20.	while	✓

Number correct 20 x5=
Percentage correct 100

Third – 1 Reader Level

Stimulus	*Response*
able	✓
added	✓
beauty	✓
cents	✓
clothe	✓
daddy	✓
different	✓
edge	✓
fasten	✓
fox	✓
half	✓
hot	✓
hundred	✓
lot	✓
lonely	✓
mind	✓
north	✓
queen	✓
secret	✓
whole	✓

Number correct 20 x5=
Percentage correct 100

Third – 2 Reader Level

Stimulus	*Response*
1. act	✓
2. beautiful	✓
3. bounce	✓
4. careful	✓
5. chance	✓
6. empty	✓
7. except	✓
8. handkerchief	✓
9. hoof	✓
10. invite	✓
11. journey	✓
12. kept	✓
13. path	✓
14. possible	✓
15. really	✓
16. scared	✓
17. spell	✓
18. sugar	✓
19. twenty	✓
20. wonderful	✓

Number correct 20 x5=

Percentage correct 100

Fourth Reader Level

Stimulus	*Response*
abandon	✓
audience	✓
beneath	✓
chimney	✓
committee	✓
crew	✓
destroy	✓
encounter	✓
gleaming	✓
harvest	✓
junior	✓
model	✓
mystery	✓
neither	✓
protect	✓
royal	✓
raise	✓
scientist	✓
strength	✓
underneath	✓

Number correct 20 x5=

Percentage correct 100

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